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conditions to the Philadelphia Academy of Natural Sciences, has finally been received by that institution. There are over six thousand trays of minerals in the collection, having an aggregate value of \$40,000. Many of the specimens are of rare beauty and perfection, some of them being unique in those respects. The collection, the result of a lifetime's labor of love, represents the inorganic world in its most beautiful garb, and incites a higher appreciation of nature's handiwork. The academy has made alterations in its building so as to secure special rooms for the collection, over which a special curator is also to be appointed. The conditions of the gift are such as to surround the collection with every safeguard against depredation.

The archæological collection is estimated to be worth at least \$10,000. It includes suites of specimens from almost all parts of the world, and is especially rich in relics of the Swiss lake dwellers, in pottery and implements of the American mound-builders, and in vases and idols from Mexico and Peru.

The sum of \$11,000 is also given to be applied to the fitting up of cases, to the care of the collections and to the purchase of specimens and books.

#### BOTANY.<sup>1</sup>

NEW WESTERN GRASSES.—No full revision of North American grasses has been attempted in many years. The writer has been a careful student of the order, and has, during the past ten years, been accumulating material for its thorough investigation.

During the past three or four years many large collections of Western grasses, made by Howell and Henderson in Oregon, Suksdorf in Washington Terr., Parish, Cleveland and Lemmon in California and Arizona, G. R. Vasey in Arizona and New Mexico, Jones in Utah and California, Reverchon and Havard in Texas and Arkansas, Wolf in Illinois, and Gattinger in Tennessee, have been in my hands; and as the result several new species have been already published and a number of others are identified and will be described and published at an early day.

Professor Scribner, of Philadelphia, has also during the past few years been carefully studying the order, having been provided with the material of several collectors. We have freely consulted together, and tried to arrive at clear results, and it is our purpose jointly to publish as soon as possible a catalogue as full and complete as our material will permit.

Toward the furtherance of this object we would be glad of the assistance of all botanists and collectors in the communication of specimens and notes which may render our labors as effective as possible.

The following list indicates some unpublished species, most of which are based upon recent collections, a few, however, having

<sup>1</sup> Edited by PROF. C. E. BESSEY, Ames, Iowa.

been several years in herbarium, and a few being modifications or changes of names for previously published species :

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| 1. <i>Panicum autumnale</i> var. <i>pubiflorum</i> .       | 16. <i>Poa kelloggii</i> .                          |
| 2. <i>Tripsacum lemmoni</i> .                              | 17. <i>Poa flexuosa</i> var. <i>occidentalis</i> .  |
| 3. <i>Aristida falmeri</i> .                               | 18. <i>Poa alsodes</i> var. <i>occidentalis</i> .   |
| 4. <i>Stipa stricta</i> .                                  | 19. <i>Poa stenantha</i> var. <i>brevifolia</i> .   |
| 5. <i>Muhlenbergia wrightii</i> .                          | 20. <i>Poa wardii</i> .                             |
| 6. <i>Sporobolus wolfii</i> ( <i>Vilfa minima</i> ).       | 21. <i>Poa elongata</i> .                           |
| 7. <i>Sporobolus interruptus</i> .                         | 22. <i>Poa nevadensis</i> .                         |
| 8. <i>Agrostis foliosa</i> .                               | 23. <i>Poa gracilis</i> .                           |
| 9. <i>Agrostis exarata</i> var. <i>littorale</i> .         | 24. <i>Glyceria lemmoni</i> ( <i>Poa lemmoni</i> ). |
| 10. <i>Trisetum montanum</i> .                             | 25. <i>Festuca jonesii</i> .                        |
| 11. <i>Grapphephorum wolfii</i> ( <i>Trisetum wolfii</i> ) | 26. <i>Bouteloua burkii</i> F. L. S.                |
| 12. <i>Danthonia intermedia</i> .                          | 27. <i>Deyeuxia tweedii</i> F. L. S.                |
| 13. <i>Bouteloua havardii</i> .                            | 28. <i>Melica fruticosa</i> F. L. S.                |
| 14. <i>Bouteloua pusilla</i> .                             | 29. <i>Muhlenbergia dumosa</i> F. L. S.             |
| 15. <i>Eragrostis neo-mexicana</i> .                       |   |

—George Vasey, *Depart. of Agric., Washington, D. C., March 6.*

MEMORANDUM AS TO THE COMPASS PLANT.—My correspondent, Rev. Dr. Thomas Hill, LL.D., formerly president of Harvard, now at Portland, Maine, thinks the stages of growth of the seedling of the compass plant (*Silphium laciniatum*) should have accurate and repeated observations, and a report of the direction of the young leaf at various dates. He made such observations in 1870, and reported them to the Troy meeting of the Am. Ass. for Adv. of Science in August, 1870 (see page 285 of Proceedings). He writes me that the drought of that summer was unfavorable, and wishes that such experiments could be tried again and minutely observed and reported. He planted in north and south rows, but (not trusting that) he says, "over the seed bed I stretched as soon as I had planted the seeds, some white cotton threads, as exactly in north and south direction as I could. Then I had simply to measure by a paper protractor the angle made by the young leaves with the threads. They should grow into rich, damp ground and be fairly exposed to light on all sides. Measure at the end of each week, keeping a record—a table." He says, "they began to turn towards the meridian when about four inches high, twisting the petioles in the whole length as they do so."

In his letter he makes a diagram, grouping together what were their directions at different dates; when very young pointing in *all* directions, but as they grew passing nearer and nearer to the meridian.—*Benjamin Alvord, Washington, D. C.*

CLASSIFICATION OF THE UREDINES.—Mr. C. B. Plowright has been studying the British plants of this group—the rusts, as they are familiarly called—and has embodied the results in a paper

published in *Grevillea* for March, 1883. The British species are arranged under nine genera, as follows:

*Uromyces*, with twenty-three species. Five tribes are recognized, viz: 1. Lepturomyces; 2. Micruromyces, in both of which teleutospores only occur; 3. Hemiuromyces, with uredo and teleutospores; 4. Uromycopsis, with æcidia and teleutospores; 5. Euromyces, with æcidia, uredo and teleutospores. The last is again subdivided into (1) species with all three spore forms on the same host plant, and (2) those with æcidia on one host and uredo and teleutospores on another.

*Puccinia*, with sixty-six species. Five tribes are recognized here also, viz: 1. Leptopuccinia; 2. Micropuccinia, both with teleutospores only; 3. Hemipuccinia, with uredo and teleutospores; 4. Pucciniopsis, with æcidia and teleutospores; 5. Eupuccinia, with æcidia, uredo and teleutospores. This tribe is divided into two sub-tribes as in *Uromyces*. The heterœcismal species are *P. graminis* of wheat and various grasses, with æcidia and on barberry; *P. rubigo-vera* of barley and various grasses (and wheat in this country), with æcidia on *Lycopsis*, *Echium* and *Symphytum*; *P. coronata* of various grasses (oats in this country) with æcidia on *Rhamnus*; *P. molinæ* of *Molinia*, with æcidia on *Orchis*; *P. poarum* of *Poa*, æcidia on *Tussilago*; *P. magnusiana* of *Phragmites*, æcidia on *Rumex*; *P. sessilis* of *Phalaris*, æcidia on *Allium*; *P. caricis* of various *Carices*, æcidia on *Urtica*; *P. sylvatica* of a *Carex*, æcidia on *Taraxacum*.

*Gymnosporangium*, with three heterœcismal species.

*Triphragmidium*, with a single species.

*Phragmidium*, with six species, in two tribes, viz: (1) *Phragmidiopsis*, with æcidia and teleutospores, and (2) *Euphragmidium*, with æcidia, uredo and teleutospores.

*Cronartium*, with a single species.

*Melampsora*, with twelve species. Four tribes are recognized, viz: 1. *Micromelampsora*, with teleutospores only; 2. *Hemimelampsora*, having uredo and teleutospores; 3. *Melampsoropsis*, having æcidia and teleutospores; 4. *Eumelampsora* with æcidia, uredo and teleutospores. This last includes but one species, *M. populina*, the rust of poplar trees (*Populus*) the æcidia of which occur on *Clematis*.

*Coleosporium*, with four species, forming two tribes: (1) *Hemicoleosporium* having only uredo and teleutospores, and (2) *Eucoleosporium* having æcidia, uredo and teleutospores. Under the latter we find *C. senecionis* of various species of *Senecio*, the æcidia, however, occurring on Scotch pine, and hitherto known under the name of *Peridermium pini*.

*Endophyllum*, with two species.

Some æcidia and uredo forms have not yet had their affinities made out; these in Mr. Plowright's paper are simply catalogued in an appendix, and await further study.

A NOTE ON *TRADESCANTIA VIRGINICA*.—Last summer I had an opportunity of observing many plants of the common spiderwort under cultivation. Two variations in the structure of the flowers were quite frequent. One was in their numerical plan, some being *dimerous* and a very few *tetramerous*. Another much more interesting variation was the transformation of stamens into petals, which throws some clear light on the morphology of the stamen. There were numerous instances illustrating this and furnishing all sorts of gradations. Some of the more important and conspicuous were the following: *First*, a fusion of the hairs on one side of the filament into a half petal, while the rest of the stamen was of the normal form; *second*, a similar fusion of the hairs on *both* sides of the filament, the anthers remaining, if not perfect, at least as yellow thickened pads at the bottom of a deep apical notch; and *third*, a petal deeply notched with purple callosities at the bottom of the notch, as though its apical portion had been arrested in its longitudinal growth and had simply increased in thickness instead. In some cases this thickened portion was elongated and partly detached from the petaloid portion. All of which goes to show:

1. The hairs on the filaments are modified portions of the blade of a petal, and therefore portions of the *phyllome*, rather than *trichome*.

2. The anthers, in this plant at least, are to be regarded as modified portions of the petal rather than outgrowths from it.—*J. E. Todd, Beloit, Wis.*

INFLUENCE OF MOONLIGHT UPON PLANTS.—M. Musset read a paper before the Paris Academy of Sciences, at its session March 5, 1883, upon the influence which the light of the moon has upon the direction of plant growth. "Plants of phototropic sensibility were grown from seeds in pots in a very dark place; then on three nights exposed at a window to direct moonlight; the stems bent over towards the moon and followed it in its course."

REMARKABLE FALL OF PINE POLLEN.—On the 18th of April of the present year, in gathering some water plants (*Zygnemaceæ*, *Saprolegniaceæ*, etc.) from a prairie pond in Central Iowa, I noticed an abundance of what turned out to be pine pollen on the surface of the water. Now there are no native pines in this part of the State, the only pines being those planted for ornamental purposes. None of these, however were in bloom, neither were the pine forests of Minnesota, Wisconsin, Michigan and northward. For some days prior to the finding of the pollen, strong south-easterly, south-westerly and westerly winds had prevailed. Doubtless these brought the pollen, but how far it was carried cannot at present be made out. However it is certain that the distance could not have been less than three or four hundred miles.—*C. E. Bessey.*

SIMILARITY OF PLANT AND ANIMAL CELLS.—In a paper on plant cells and living matter, by Dr. L. Elsberg, in the *Quarterly Journal of Microscopical Science* for January, the author concludes that the frame of cellulose, analogously to the cement substance of animal epithelia and the basis substance of other animal tissues, is pierced by either single filaments of living matter or a reticulum with more or less large accumulations of living matter, interconnecting all neighboring tissue elements, and that the plant, therefore, like the animal, is one continuous mass of living matter, with interspaces which contain some non-living material.

BOTANICAL NOTES.—A. P. Morgan publishes, in the *Journal of the Cincinnati Society of Natural History* (April, 1883) a valuable paper on "The Mycologic Flora of the Miami valley, Ohio." Descriptions are given of eighty species of white spored Agarics found in the region designated. Among these are five new species, viz., *Agaricus miamensis*, *A. granosus*, *A. monadelphus*, *A. estensis*, and *A. alboflavus*, all of which are excellently illustrated by large lithographic plates. A second paper is promised which will treat in a similar manner the remaining Agaricini.—Dr. C. S. Dolley, of Rochester, N. Y., has again deserved the thanks of biological students by translating Dr. T. W. Engelmann's paper on "The Physiology of Protoplasmic Motion." It is issued as a neat pamphlet of forty pages, and is well worth the price asked, viz., fifty cents.—We are to have another fern book; this time from the pen of Mr. G. E. Davenport, whose name is a sufficient guarantee of the excellence of the work. He has just published "Some comparative tables showing the distribution of ferns in the United States," as preliminary to his promised book. One hundred and fifty-five species are enumerated, and their geographical range given.—"The Bacteria," by Professor T. J. Burrill, is a stout pamphlet of sixty-five pages devoted to the discussion and description of Bacteria and the Saccharomycetes. The descriptions are mainly translated from Winter's edition of Rabenhorst's *Kryptogamen Flora*. It is a valuable addition to the literature of these interesting plants.—Those wishing to add to their stock of valuable papers on the Bacteria, will do well to secure a copy of Dr. D. E. Salmon's "Investigation of Swine Plague, Fowl Cholera and Southern Cattle Fever," in the Report of the Department of Agriculture at Washington, for the year 1881-2.—In the same report Dr. Vasey has a paper on grasses and other forage plants, illustrated by twenty-five full-page plates. These annual papers by Dr. Vasey have long given much value to the Department reports.—The March *Torrey Bulletin* contains among other interesting notes, one by Dr. Vasey on "Three hybrid Oaks," with three plates; "New and little-known Ferns of the U. S.," by Professor Eaton, and "A list of Western Grasses," by F. L. Scribner.—The "Lectures to the employees of the Baltimore and Ohio Railroad Company," delivered last

year and now issued in pamphlet form, include one "On Fermentation," by Dr. Sedgwick, which is a model of simplicity coupled with accuracy. Excellent figures are given of yeast plants and many forms of Bacteria.—Dr. Rothrock has been studying the microscopical distinctions between good and bad timber, some of the results of which he embodied in a paper read before the Am. Phil. Society, Feb. 2, 1883. A plate accompanies the paper. We should like to see more work like this done.—In the April *Journal of Botany* appears a list of "New genera and species of Phanerogams published in periodicals in Britain in 1882," which ought to find a counterpart in some of our American journals for American plants.—J. C. Arthur describes and figures a new variety of the common walking-leaf fern (*Camptosorus rhizophyllus* Link., var. *intermedius*) in the April *Bot. Gazette*. It approaches *C. sibiricus* in shape of leaf and character of the fibro-vascular bundle. It was collected on limestone cliffs in Eastern Iowa.

#### ENTOMOLOGY.<sup>1</sup>

THE NEW CLASSIFICATION OF THE COLEOPTERA OF NORTH AMERICA.—This important work, prepared by Drs. LeConte and Horn, and to which we referred to on p. 515 of last year's *NATURALIST*, has just been published by the Smithsonian Institution as No. 507 of its *Miscellaneous Contributions*. Its appearance will be hailed with joy not only by coleopterists in this country, but by all those interested in Entomology. It is a stately volume of 567 pages, and though the general arrangement of matter is as in the first "Classification," the present volume is much more than a mere second edition thereof. In the former work the Phytophaga, Rynchophora and what was formerly known as Trimeria were not reached, whereas the new classification covers the whole order, is almost entirely re-written, and is brought up to date.

The general arrangement of the families is in the main that proposed by Crotch, with but one important change, viz., that the Serricornia are placed before the Lamellicornia, the authors justifying this change by the close relationship existing between some members of the Clavicorn series and the Serricornia. This relationship, in the arrangement usually adopted, was interrupted and obscured by the interposition of the Lamellicornia.

The Platypsyllids and the Stylopids are given but family rank in the Clavicornia and Heteromera respectively.

To the beginner we especially recommend a careful study of the introduction, which gives a very clear exposition of the external anatomy of the Coleoptera, illustrated by original figures drawn by Dr. Horn.

<sup>1</sup> This department is edited by PROF. C. V. RILEY, Washington, D. C., to whom communications, books for notice, etc., may be sent.